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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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CHRISTOPHER F. REGAN
ALLEN, DYER, DOPPELT, MILBRATH & GILCHRIST, PA
P.O. BOX 3791
ORLANDO, FL 32802-3791

EXAMINER

NGUYEN, DUNG X

ART UNIT PAPER NUMBER

2631

DATE MAILED: 04/02/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/147,230

Applicant(s)

OLSSON ET AL.

Examiner

Dung X Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30 - 58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30 - 58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 30 December 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Response to Arguments

1. Applicant's arguments filed on December 30, 2002 have been fully considered but are moot in view of the new ground(s) of rejection and not persuasive.

The parameter $Y_{n,k}$ shown in equations for estimating the argument function α_k must be supported by the original disclosure. Any parameter changed makes the result of the equation altered also.

Based on the above rationale, it is believed that the parameter $Y_{n,k}$ has changed the outcome of the argument function α_k . Therefore, the rejections are still maintained.

The examiner withdraws the restriction requirements in the Office Action filed on September 27, 2002.

Specification

2. The amendment filed on 06 March 2002 to claims 39, 40, 54, and 55 introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The parameter $Y_{n,k}$ is not shown and supported by the original disclosure as filed.

3. This application is a 371 of PCT international application filed on 27 February 1998, that information must be stated at the beginning of the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The followings are quotations of the first paragraph and the second paragraph of 35 U.S.C. 112:

(1) The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

(2) The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 39 - 42, and 54 - 57 are rejected** under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding to claims 39, 40, 54, and 55 the parameter $Y_{n,k}$ is not shown and supported by the original disclosure.

6. **Claims 31 - 38, 44, and 46 - 53, are rejected** under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 31, the claimed invention of separation means for separating the equalizer inverse channel model into a first and a second part. However, the first part is never used.

Regarding claim 44, the limitations are analyzed in the same manner set forth as claim 31.

Regarding claim 46, the limitations are analyzed in the same manner set forth as claim 31.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 30, 43, 45, and 58 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Isaksson et al. (US patent # 5,812,523).

Regarding claim 30, Isaksson et al. discloses (figure 1):

- A receiver (figure 1) comprising a sampling oscillator (NCO) and a controller connected thereto (frequency control signal);
- The controller for controlling the sampling oscillator (NCO) and estimating timing deviation (frequency error) of the sampling oscillator (abstract) inherent deriving entirely and directly from frequency input data by a feedback signal.

Isaksson et al. differs from the instant claimed invention that it does not use a cyclic prefix in frame. However, Isaksson et al. discloses that the absolute value of the fourth signal is periodic with the OFDM frame length (column 2, lines 54 – 57). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use Isaksson et al. and add the cyclic prefix to the frame to deal with the periodic matter with the OFDM frame length.

Regarding claim 43, the limitations are analyzed in the same manner set forth as claim 30.

Regarding claim 45, the limitations are analyzed in the same manner set forth as claim 30.

Regarding claim 58, the limitations are analyzed in the same manner set forth as claim 30.

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9. **Claims 31 - 38, 44, and 46 - 53 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Isaksson et al. (US patent # 5,812,523), further in view of Schmidl et al. (US patent # 5,732,113).

Regarding claim 31, Isaksson et al. discloses (figure 1):

- A receiver (figure 1) comprising a sampling oscillator (NCO) and a controller connected thereto (frequency control signal);
- A channel model;
- The controller for controlling the sampling oscillator (NCO) and estimating timing deviation (frequency error) of the sampling oscillator (abstract) inherent deriving entirely and directly from frequency input data by a feedback signal.

Isaksson et al. differs from the instant claimed invention that it does not use the cyclic prefix in frame, which is a repetition of part of the frame, and separations means for separating the equalizer inverse channel model into a first and a second part. However, Schmidl et al. discloses the cyclic prefix, which is generally a repetition of frame (column 2, lines 38 - 47). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Isaksson et al. and Schmidl et al. to provide the cyclic prefix in frame to prevent inter-symbol interference, and also does not need to separate the channel model into a first and a second part because the first part is not used.

Regarding claim 32, the limitations analyzed in claim 30 are equally applied to this claim. Isaksson et al. differs from the instant claimed invention that it does not use wherein control means comprises estimation means estimating timing deviations of the sampling oscillator, and wherein the estimation means operates entirely on frequency domain input data. However, Schmidl et al. discloses automatic gain control (AGC) loop provides the estimation (column 17, lines 39 - 40) for estimating timing deviations of the sampling oscillator, and it operates entirely on frequency domain input data (column 9, lines 36 - 41). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Isaksson et al. and Schmidl et al. to provide estimating timing deviations of the sampling oscillator, and it operates entirely on

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frequency domain input data for re-adjusting the sampling oscillator by the estimation of the timing deviation in entire frequency domain input data.

Regarding claim 33, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to estimate an approximation of a linear portion of an argument function produced by timing deviations of the sampling oscillator.

Regarding claim 34, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the estimation means for finding the linear portion of an argument function by taking an average slope of the argument function.

Regarding claim 35, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the approximation of the linear portion of the argument function being used as a feedback control signal for sampling oscillator.

Regarding claim 36, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide wherein the approximation of the linear portion of the argument function has a slope, which converges to zero as the control loop settles.

Regarding claim 37, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provider the controller continuously adapts to variations in sampling timing.

Regarding claim 38, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the channel model and the control means each uses defined and different portions of the channel model to achieve an output frequency domain signal with zero phase deviation relative to a transmitted signal.

Regarding claim 44, the limitations are analyzed in the same manner set forth as claim 31.

Regarding claim 46, the limitations are analyzed in the same manner set forth as claim 31.

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Regarding claim 47, the limitations are analyzed in the same manner set forth as claim 32.

Regarding claim 48, the limitations are analyzed in the same manner set forth as claim 33.

Regarding claim 49, the limitations are analyzed in the same manner set forth as claim 34.

Regarding claim 50, the limitations are analyzed in the same manner set forth as claim 35.

Regarding claim 51, the limitations are analyzed in the same manner set forth as claim 36.

Regarding claim 52, the limitations are analyzed in the same manner set forth as claim 37.

Regarding claim 53, the limitations are analyzed in the same manner set forth as claim 38.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Raleigh et al. (US patent # 6,144,711) discloses a spatio-temporal processing for communication.

Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung X. Nguyen whose telephone number is (703) 305-4892. The examiner can normally be reached on Monday through Friday from 9:00 AM to 6:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Chi Pham can be reached on (703) 308-4378. The fax phone numbers for this group is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

DXN

March 12, 2003

TESEALDET BOCURE
PRIMAIRE EXAMINER

